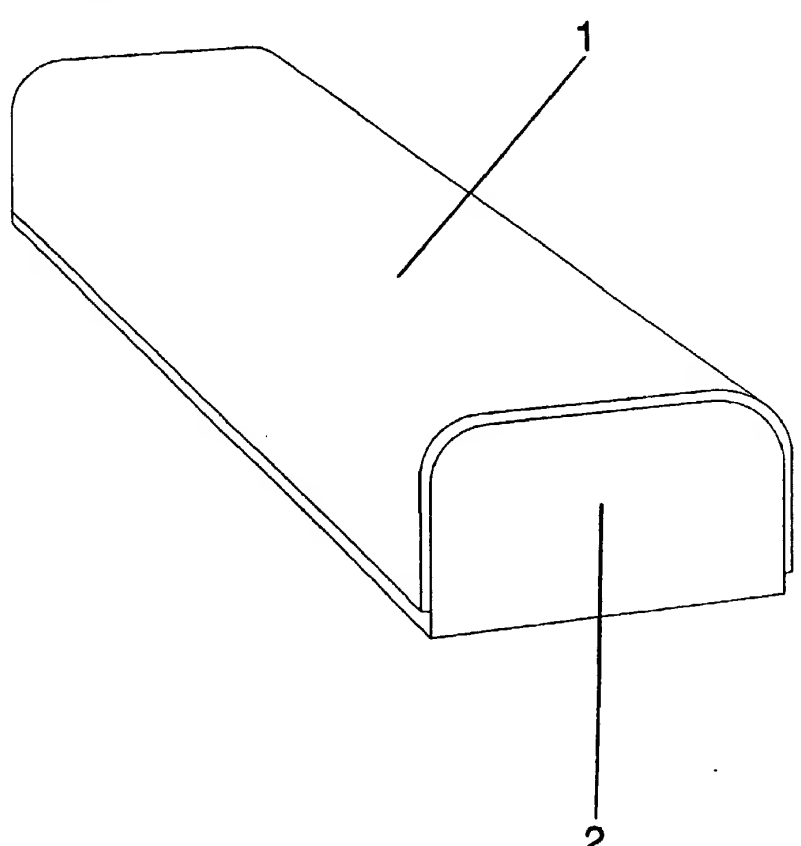


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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : E04F 19/02, B27M 3/04, B32B 27/04</p>	<p>A1</p>	<p>(11) International Publication Number: WO 96/12857 (43) International Publication Date: 2 May 1996 (02.05.96)</p>
<p>(21) International Application Number: PCT/SE95/01206 (22) International Filing Date: 17 October 1995 (17.10.95) (30) Priority Data: 9403620-9 24 October 1994 (24.10.94) SE (71) Applicant (for all designated States except US): PERSTORP FLOORING AB [SE/SE]; P.O. Box 1010, S-231 25 Trelleborg (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): KORNFÄLT, Sven [SE/SE]; Sallerupsvägen 18, S-212 18 Malmö (SE). BENGTSSON, Per [SE/SE]; Skolgatan 13B, S-260 51 Ekeby (SE). SJÖLIN, Hans [SE/SE]; Klockarevägen 5, S-284 33 Perstorp (SE). (74) Agent: STENBERG, Yngve; Perstorp AB, S-284 80 Perstorp (SE).</p>		<p>(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
<p>(54) Title: PROCESS FOR THE PRODUCTION OF A FLOOR STRIP</p> <p>(57) Abstract</p> <p>A thin abrasion resistant decorative thermosetting laminate of postforming quality is glued to a longitudinal carrier. The carrier preferably consists of a fibre board or a particle board with a rectangular cross section and at least two opposite rounded-off edges. One or more floor strips with the same or different cross section is machined from the laminate clad carrier.</p> 		

PROCESS FOR THE PRODUCTION OF A FLOOR STRIP

The present invention relates to a process for the production of a floor strip such as a dilatation profile, a transition profile or a finishing profile.

It is previously known to produce floor strips such as metal strips, wood veneer coated strips and strips of homogeneous wood.

There is a strong desire to bring about a floor strip with the same pattern as on a floor of thermosetting laminate. During the last years these floors have become very usual. For instance they are made with wood pattern, marble pattern and phantasy pattern. Possibly you can use a homogeneous wood strip or a wood veneer coated strip for a few of the wood patterned floors. Previously known strips do not go well together with all the other floor patterns.

In addition the purpose of the present invention is to provide a floor strip with improved abrasion resistance.

According to the present invention it has quite surprisingly been possible to meet the above needs and bring about a process for the production of floor strips such as a dilatation profile, a transition profile or a finishing profile. The process comprises glueing, preferably under heat and pressure a thin decorative thermosetting laminate of postforming quality having an abrasion resistance measured as IP-value >3000 revolutions, preferably >6000 revolutions, on a longitudinal carrier, which carrier preferably consists of a fibre board or a particle board with a rectangular cross-section and at least two opposite rounded-off edges. The postforming laminate is glued in one piece on the upper side and two long sides of the carrier via the rounded-off edges, whereupon one or more floor profiles having the same or different cross-section is machined from the laminate coated carrier.

According to one embodiment the carrier can be provided with a rectangular cross-section with three rounded-off edges.

One great advantage of the process for the production according to the invention is that it is very rational. From the same body, the laminate clad carrier, several profiles with varying shape can be machined. Usually a milling machine is used for machining the different kinds of profiles from the laminate coated carrier.

Preferably the carrier is water resistant. At a preferred embodiment the carrier consists of a high density fibre board made of fine fibres.

At a preferred embodiment the postforming laminate is glued in one piece on three of the four longitudinal sides of the carrier, preferably on the upper side and two long sides via the rounded-off edges. Advantageously, a heat and moisture resistant glue is used at the glueing. Preferably the glueing is carried out under heat and pressure. For instance the pressure can be regulated by means of rollers which press the laminate against the carrier. The temperature can for instance be regulated with heating nozzles which can give an even current of warm air.

At another embodiment the carrier can be provided with a rectangular cross-section and three rounded-off edges. The postforming laminate is then glued in one piece on all four sides of the carrier via the rounded-off edges.

Suitably the postforming laminate consists of at least one monochromatic or patterned paper sheet impregnated with a thermosetting resin, preferably melamine-formaldehyde resin and preferably one or more sheets for instance of parchment, vulcanized fibres or glass fibres. The last mentioned sheets are preferably not impregnated with any thermosetting resin, but the thermosetting resin from the sheets situated above will enter these sheets at the laminating step, where all sheets are bonded together.

Generally the term postforming laminate means a laminate which is so flexible that it can be formed at least to a certain extent after the production thereof. Ordinary qualities of thermosetting decorative laminates are rather brittle and cannot be regarded as postforming laminates.

Usually the postforming laminate includes at least one uppermost transparent paper sheet made of α -cellulose and impregnated with a thermosetting resin, preferably melamine-formaldehyde resin. This so-called overlay is intended to protect an underlying decor sheet from abrasion.

Often at least one of the paper sheets of the postforming laminate impregnated with thermosetting resin, preferably the uppermost one is coated with hard particles for instance silica, aluminium oxide and/or silicon carbide with an average particle size of about 1-80 μm , preferably about 5-60 μm evenly distributed over the surface of the paper sheet.

In a preferred embodiment the hard particles are applied on the resin impregnated paper surface before the resin has been dried.

The hard particles improve the abrasion resistance of the laminate. Hard particles are used in the same way at the production of laminates which are subject to a hard wear such as flooring laminates.

The abrasion resistance of the postforming laminates are tested according to the European standard EN 438-2/6:1991. According to this standard the abrasion of the decor sheet of the finished laminate to the so-called IP-point (initial point) is measured, where the starting abrasion takes place.

The IP-value suitably lies within the interval 3000-20000, preferably 3000-10000 revolutions.

Thus, the manufacturing process according to the invention makes it possible to produce laminate clad profiles with the same surface pattern and about the same abrasion resistance as the laminate floorings they are intended to go together with.

Of course the pattern of the profiles can also be adapted to other flooring materials than laminate floorings, such as parquette floorings and soft plastic floorings.

The present invention will be explained further in connection with the embodiment example below and the enclosed figures of which figure 1 shows a postforming laminate 1 glued to a longitudinal carrier 2. Figure 2 shows a dilatation profile 3 with a postforming laminate 1 glued thereto, while figure 3 illustrates a finishing profile 4 with a postforming laminate 1 glued thereto. Finally figure 4 shows a transition profile 5 with a postforming laminate 1 glued thereto.

On the figures the thickness of the postforming laminate 1 has been magnified as compared to the size of the carrier 2 and the profiles 3-5 respectively to better illustrate that a postforming laminate 1 is glued to the carrier 2 and the profiles 3-5 respectively.

Of course the figures 1-4 only show one embodiment of the carrier 2 and the profiles 3-5 respectively which can be produced according to the invention. Various other designs are possible.

Example

A roll of transparent so-called overlay paper of α -cellulose with a surface weight of 25 g/m^2 was impregnated with an aqueous solution of melamine-formaldehyde resin to a resin content of 70 percent by weight calculated on dry impregnated paper. Immediately after the impregnation, aluminium oxide particles with an average particle size of $50 \text{ }\mu\text{m}$ were applied to the upper side of the paper in an amount of 7 g/m^2 by means of a doctor-roll placed above the paper web.

Thus, the hard aluminium particles were applied in the melamine-formaldehyde resin which had not been dried yet.

The impregnated paper web was then fed continuously into a heating oven, where the solvent was evaporated. At the same time the resin was partially cured to so-called B-stage. Thereby the aluminium oxide particles were enclosed in the resin layer and accordingly concentrated to the surface of the product obtained which is usually called prepreg. The prepreg web obtained was then rolled again.

A roll of conventional nontransparent so-called decor paper with a decor pattern printed thereon and having a surface weight of 80 g/m^2 was treated in the same way as the overlay paper except for the fact that no aluminium oxide particles were applied and that the resin content was 50 percent by weight calculated on dry impregnated paper.

A roll of unimpregnated parchment with a surface weight of 120 g/m^2 was used at the production of the postforming laminate.

The two prepreg webs impregnated with melamine-formaldehyde resin and the unimpregnated parchment web were pressed between two press bands of a continuous laminating press to a decorative postforming laminate.

At the pressing a prepreg web of α -cellulose was placed on top with the side with the hard particles directed upwards. Underneath followed a prepreg web of decor paper and at the bottom a web of parchment. The prepreg webs and the parchment web were pressed together at a pressure of 35 kp/cm^2 and at a temperature of 170°C .

The decorative postforming laminate obtained was cut with roller knives to strips of suitable length and width.

A longitudinal carrier 2 with a rectangular cross-section and two opposite rounded-off edges according to figure 1 was machined from a fibre board by means of a milling machine. The fibre board was a water resistant board of so-called MDF-quality (medium density fibre board quality) of high density made of finely divided fibres.

A strip of postforming laminate 1 was glued under heat and pressure to the longitudinal carrier 2 with a heat and moisture resistant glue. The pressure was regulated with rolls which pressed the laminate against the carrier and the temperature was regulated with heating nozzles which blew an even current of warm air.

A dilation profile 3 according to figure 2 was machined from the laminate clad carrier by milling.

Instead two finishing profiles 4 according to figure 3 or one transition profile 5 according to figure 4 can be produced from the same carrier. This results in a rational and cost-saving production.

The abrasion resistance of the postforming laminate obtained was measured. Then a value for the IP-point amounting to 7000 revolutions was obtained.

The present invention is not limited to the embodiments disclosed, since these can be modified in different ways within the scope of the present invention.

CLAIMS

1. Process for the production of a floor strip such as a dilatation profile, a transition profile or a finishing profile, which comprises glueing preferably under heat and pressure a thin decorative thermosetting laminate of postforming quality having an abrasion resistance measured as IP-value >3000 revolutions, preferably >6000 revolutions, on a longitudinal carrier, which carrier preferably consists of a fibre board or a particle board with a rectangular cross-section and at least two opposite rounded-off edges, whereby the postforming laminate in one piece is glued on the upper side and two long sides of the carrier via the rounded-off edges, whereupon one or more floor profiles having the same or different cross-section is machined from the laminate coated carrier.
2. Process according to claim 1 wherein a water resistant carrier is used.
3. Process according to claim 1 or 2, wherein the postforming laminate consists of at least one monochromatic or patterned paper sheet impregnated with a thermosetting resin, preferably melamine-formaldehyde resin and preferably one or more sheets for instance consisting of parchment, vulcanized fibres or glass fibres which preferably are not impregnated with a thermosetting resin.
4. Process according to any one of claims 1-3, wherein the postforming laminate includes at least one uppermost transparent paper sheet, so-called overlay of α -cellulose impregnated with a thermosetting resin, preferably melamine-formaldehyde resin.
5. Process according to any one of claims 1-4 wherein at least one of the paper sheets of the postforming laminate being impregnated with thermosetting resin, preferably at least the uppermost sheet is coated with hard particles for example silica, aluminium oxide and/or silicon carbide with an average particle size of 1-80 μm , preferably about 5-60 μm evenly distributed over the surface of the paper sheet.
6. Process according to any one of claims 1-5, wherein the IP-value lies within the interval 3000-20000 revolutions, preferably 3000-10000 revolutions.

Fig. 1

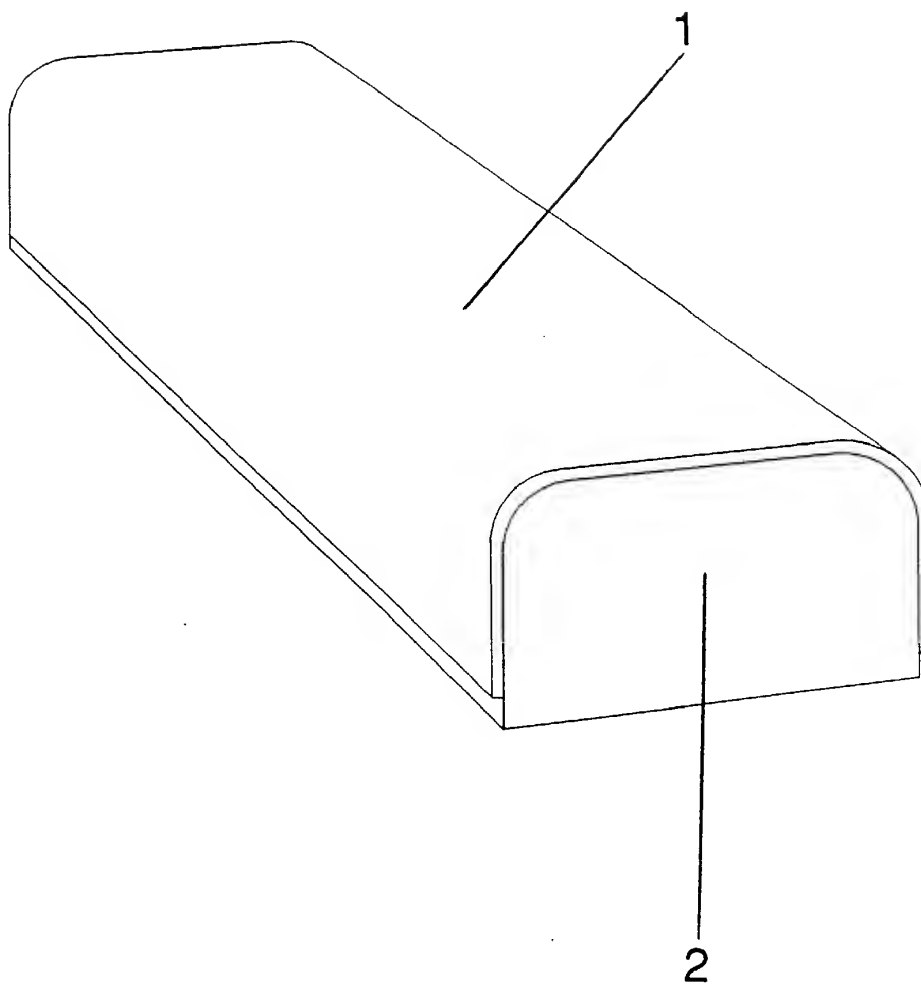


Fig. 2

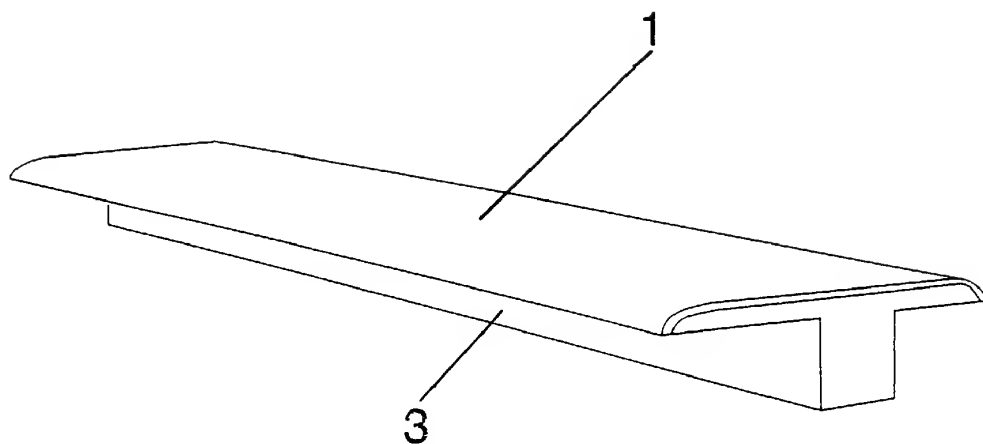


Fig. 3

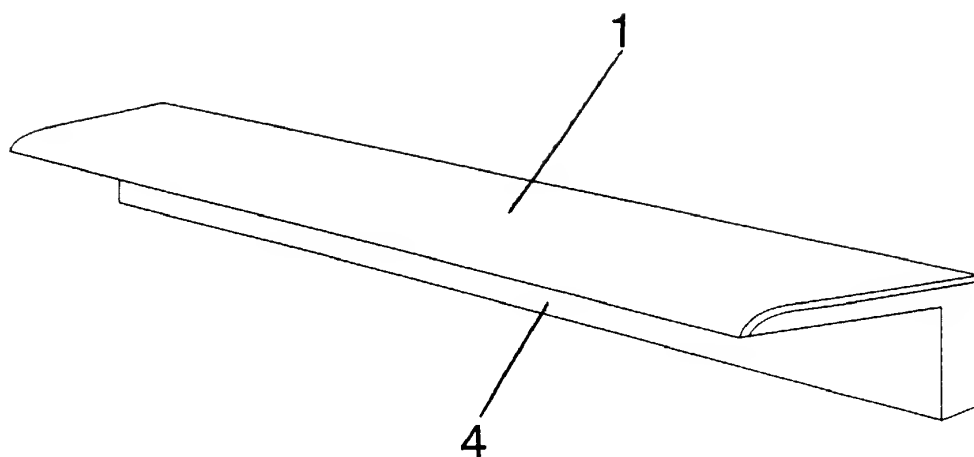
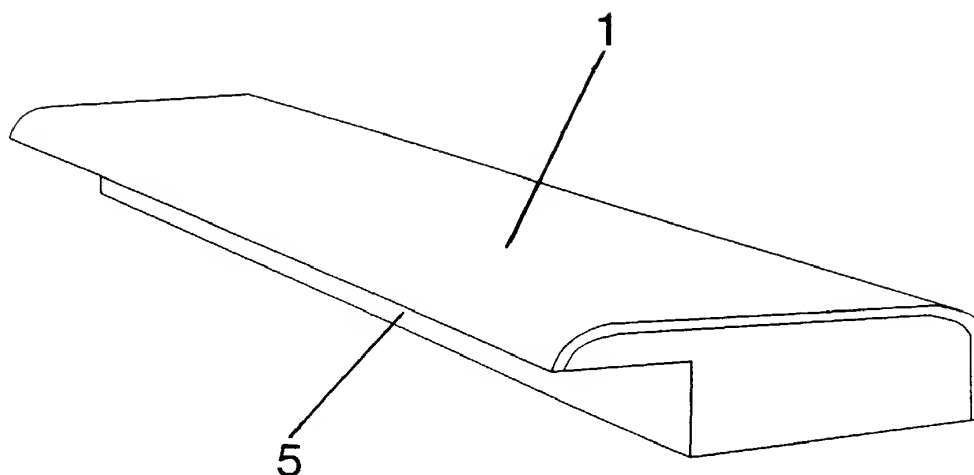


Fig. 4



INTERNATIONAL SEARCH REPORT

1

International application No.

PCT/SE 95/01206

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E04F 19/02, B27M 3/04, B32B 27/04

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B. FIELDS SEARCHED

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

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A	SE 467150 B (PERSTORP AB), 1 June 1992 (01.06.92), page 4, line 18 - line 30; page 5, line 1 - line 17 --	1-6
A	US 3671369 A (A.M. KVALHEIM ET AL), 20 June 1972 (20.06.72), column 1, line 12 - line 16; column 2, line 65 - line 72; column 3, line 1 - line 3 --	1-6



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

Date of mailing of the international search report

28 March 1996

29 -03- 1996

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/01206

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4643237 A (J. ROSA), 17 February 1987 (17.02.87), abstract -- -----	1-6

INTERNATIONAL SEARCH REPORT
Information on patent family members

05/02/96

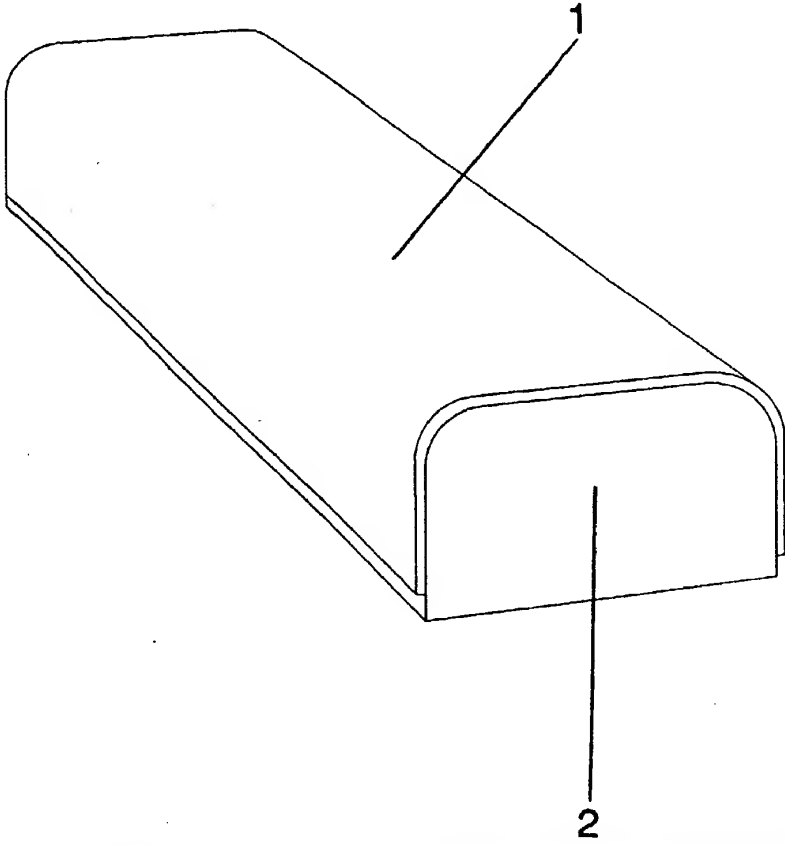
International application No.

PCT/SE 95/01206

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		CA-A- 1321133	10/08/93
		DE-D,T- 68916877	15/12/94
		EP-A,A,A 0355829	28/02/90
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		EP-A,A- 0590693	06/04/94
		EP-A,A- 0592013	13/04/94
		ES-T- 2059659	16/11/94
		NO-B,C- 174336	10/01/94
		SE-A- 8802982	26/02/90
		US-A- 5034272	23/07/91
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		FR-A,B- 2561161	20/09/85
		US-A- 4800796	31/01/89



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : E04F 19/02, B27M 3/04, B32B 27/04	A1	(11) International Publication Number: WO 96/12857 (43) International Publication Date: 2 May 1996 (02.05.96)
(21) International Application Number: PCT/SE95/01206 (22) International Filing Date: 17 October 1995 (17.10.95) (30) Priority Data: 9403620-9 24 October 1994 (24.10.94) SE (71) Applicant (for all designated States except US): PERSTORP FLOORING AB [SE/SE]; P.O. Box 1010, S-231 25 Trelleborg (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): KORNFÄLT, Sven [SE/SE]; Sallerupsvägen 18, S-212 18 Malmö (SE). BENGTTSSON, Per [SE/SE]; Skolgatan 13B, S-260 51 Ekeby (SE). SJÖLIN, Hans [SE/SE]; Klockarevägen 5, S-284 33 Perstorp (SE). (74) Agent: STENBERG, Yngve; Perstorp AB, S-284 80 Perstorp (SE).		(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: PROCESS FOR THE PRODUCTION OF A FLOOR STRIP (57) Abstract <p>A thin abrasion resistant decorative thermosetting laminate of postforming quality is glued to a longitudinal carrier. The carrier preferably consists of a fibre board or a particle board with a rectangular cross section and at least two opposite rounded-off edges. One or more floor strips with the same or different cross section is machined from the laminate clad carrier.</p> <div style="text-align: right;">  </div>		

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1

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US-A-	3671369	20/06/72	NONE	
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PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference Case 484 PCT	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/SE 95/01206	International filing date (day/month/year) 17 October 1995	(Earliest) Priority Date (day/month/year) 24 October 1994
Applicant Perstorp Flooring AB et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).
2. ☐ Unity of invention is lacking (See Box II).
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
 - ☐ filed with the international application.
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Figure No. 1 ☐ as suggested by the applicant. ☐ None of the figures.
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☐ because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

1

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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 March 1996

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Date of mailing of the international search report

29 -03- 1996

Authorized officer

Örjan Nylund

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/01206

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4643237 A (J. ROSA), 17 February 1987 (17.02.87), abstract -- -----	1-6

INTERNATIONAL SEARCH REPORT
Information on patent family members

05/02/96

International application No.

PCT/SE 95/01206

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US-A-	4198455	15/04/80	NONE		
SE-B-	467150	01/06/92	AT-T-	108731	15/08/94
			CA-A-	1321133	10/08/93
			DE-D,T-	68916877	15/12/94
			EP-A,A,A	0355829	28/02/90
			SE-T3-	0355829	
			EP-A,A-	0590693	06/04/94
			EP-A,A-	0592013	13/04/94
			ES-T-	2059659	16/11/94
			NO-B,C-	174336	10/01/94
			SE-A-	8802982	26/02/90
			US-A-	5034272	23/07/91
US-A-	3671369	20/06/72	NONE		
US-A-	4643237	17/02/87	CA-A-	1246427	13/12/88
			EP-A,B-	0160613	06/11/85
			SE-T3-	0160613	
			FR-A,B-	2561161	20/09/85
			US-A-	4800796	31/01/89

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark
Office
(Box PCT)
Washington D.C. 20231
United States of America

in its capacity as elected Office

Date of mailing (day/month/year) 14 May 1996 (14.05.96)	
International application No. PCT/SE95/01206	Applicant's or agent's file reference Case 484 PCT
International filing date (day/month/year) 17 October 1995 (17.10.95)	Priority date (day/month/year) 24 October 1994 (24.10.94)
Applicant KORNFÄLT, Sven et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

26 April 1996 (26.04.96)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

F. Gateau

Telephone No.: (41-22) 730.91.11

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 25 OCT 1996

WIPO PCT

20

Applicant's or agent's file reference Case 484 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE95/01206	International filing date (day/month/year) 17.10.1995	Priority date (day/month/year) 24.10.1994
International Patent Classification (IPC) or national classification and IPC ₆ E04F 19/02, B27M 3/04, B32B 27/04		
Applicant Perstorp Flooring AB et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 26.04.1996	Date of completion of this report 19.09.1996
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Örjan Nylund Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE95/01206

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

- ☒ the international application as originally filed.
- ☐ the description, pages _____, as originally filed,
 pages _____, filed with the demand,
 pages _____, filed with the letter of _____,
 pages _____, filed with the letter of _____.
- ☐ the claims, Nos. _____, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. _____, filed with the letter of _____,
 Nos. _____, filed with the letter of _____.
- ☐ the drawings, sheets/fig _____, as originally filed,
 sheets/fig _____, filed with the demand
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE95/01206

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-6</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-6</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims		NO

2. Citations and explanations

The present invention relates to a process for the production of a floor strip such as a dilatation profile, a transition profile or a finishing profile.

The purpose of the invention is to produce a floor strip with the same pattern as on a floor of thermosetting laminate. Another purpose is to provide a floor strip with improved abrasion resistance.

According to the invention a thin abrasion resistant decorative thermosetting laminate is glued to a longitudinal carrier. Thereafter, one or more floor strips with the same or different cross-sections is machined from the laminated clad carrier.

US 4198455 is considered to be the most relevant citation. This document describes a moulding strip formed of a plywood substrate covered by an overlay film of flexible decorative PVC material. A groove is cut in the plywood carrier so that the film functions as a hinge to facilitate bending of the strip into, and around corners.

The invention differs from what previously known in that the laminate glued to the carrier has a high abrasion resistance. It also differs in that different cross-sections is machined from the laminate coated carrier.

Therefore, the subject matter claimed is novel. It can also be considered to involve an inventive step and to have industrial applicability.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Case 484 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE95/01206	International filing date (day/month/year) 17.10.1995	Priority date (day/month/year) 24.10.1994
International Patent Classification (IPC) or national classification and IPC ₆ E04F 19/02, B27M 3/04, B32B 27/04		
Applicant Perstorp Flooring AB et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of <u>3</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 26.04.1996	Date of completion of this report 19.09.1996
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Örjan Nylund Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE95/01206

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

- ☒ the international application as originally filed.
- ☐ the description, pages _____, as originally filed,
 pages _____, filed with the demand,
 pages _____, filed with the letter of _____,
 pages _____, filed with the letter of _____.
- ☐ the claims, Nos. _____, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. _____, filed with the letter of _____,
 Nos. _____, filed with the letter of _____.
- ☐ the drawings, sheets/fig _____, as originally filed,
 sheets/fig _____, filed with the demand
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE95/01206

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-6</u>	YES
	Claims	<u></u>	NO
Inventive step (IS)	Claims	<u>1-6</u>	YES
	Claims	<u></u>	NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims	<u></u>	NO

2. Citations and explanations

The present invention relates to a process for the production of a floor strip such as a dilatation profile, a transition profile or a finishing profile.

The purpose of the invention is to produce a floor strip with the same pattern as on a floor of thermosetting laminate. Another purpose is to provide a floor strip with improved abrasion resistance.

According to the invention a thin abrasion resistant decorative thermosetting laminate is glued to a longitudinal carrier. Thereafter, one or more floor strips with the same or different cross-sections is machined from the laminated clad carrier.

US 4198455 is considered to be the most relevant citation. This document describes a moulding strip formed of a plywood substrate covered by an overlay film of flexible decorative PVC material. A groove is cut in the plywood carrier so that the film functions as a hinge to facilitate bending of the strip into, and around corners.

The invention differs from what previously known in that the laminate glued to the carrier has a high abrasion resistance. It also differs in that different cross-sections is machined from the laminate coated carrier.

Therefore, the subject matter claimed is novel. It can also be considered to involve an inventive step and to have industrial applicability.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

Perstorp AB
284 80 PERSTORP

BEST AVAILABLE COPY

NOTIFICATION OF RECEIPT OF DEMAND

(PCT Rule 61.1(b), first sentence
and Administrative Instructions, Section 601)

Date of mailing (day/month/year) **30 -04- 1996**

Applicant's or agent's file reference
Case 484 PCT

IMPORTANT NOTIFICATION

International application No.
PCT/SE95/01206

International filing date (day/month/year)
17-10-1995

Priority date (day/month/year)
24-10-1994

Applicant
**Perstorp Flooring AB
et al**

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

26-04-1996

2. This date of receipt is:

- ☒ the actual date of receipt of the demand.
☐ the date on which the proper corrections to the demand were timely received.

3. ☐ This date is AFTER the expiration of 19 months from the priority date.

Attention: The election(s) made in the demand does (do) not have the effect of postponing the commencement of the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22).

For details, see Annex B to Form PCT/IB/301 sent by the International Bureau and Volume II of the PCT Applicant's Guide.

- ☐ This notification confirms the information given in person or by telephone on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/
Patent- och registreringsverket
Box 5055
S-102 42 STOCKHOLM
Facsimile No. 08-667 72 88

Telex
17978
PATOREG-S

Authorized officer

LINDA MELLQVIST

Telephone No. 08-782 25 00

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

STENBERG, Yngve
Perstorp AB
S-284 80 Perstorp
SUEDE

BEST AVAILABLE COPY

Date of mailing (day/month/year) 02 May 1996 (02.05.96)		
Applicant's or agent's file reference Case 484 PCT		IMPORTANT NOTICE
International application No. PCT/SE95/01206	International filing date 17 October 1995 (17.10.95)	Priority date 24 October 1994 (24.10.94)
Applicant PERSTORP-FLOORING AB et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AT, AU, BR, CA, CN, CZ, DE, EP, FI, GB, JP, KP, KR, LK, NO, NZ, PL, RO, RU, SK, US

2. In accordance with Rule 47.1(c), third sentence, each designated Office will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Offices.

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on

02 May 1996 (02.05.96) under No. WO 96/12857

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No.: (41-22) 740 14 35	Telephone No.: (41-22) 730 91 11

Continuation of Form PCT/IB/308

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF
THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

Date of mailing (day/month/year) 02 May 1996 (02.05.96)	IMPORTANT NOTICE
Applicant's or agent's file reference Case 484 PCT	International application No. PCT/SE95/01206
<p>The designated Office(s) of:</p> <p>AM, AP, BB, BG, BY, CH, DK, EE, ES, GE, HU, IS, KE, KG, KZ, LR, LT, LU, LV, MD, MG, MN, MW, MX, OA, PT, SD, SE, SG, SI, TJ, TM, TT, UA, UG, UZ, VN</p> <p>has (have) waived the requirement for such a communication, but nevertheless a copy of the international application need not be furnished by the applicant to the Office(s) concerned.</p> <p>The applicant is hereby notified that, at the time of establishment of this Notice, the time limit under Rule 46.1 for making amendments under Article 19 has not yet expired and the International Bureau had received neither such amendments nor a declaration that the applicant does not wish to make amendments.</p>	

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING
SUBMISSION OF PRIORITY DOCUMENTS

(PCT Administrative Instructions, Section 411)

To:

STENBERG, Yngve
Perstorp AB
S-284 80 Perstorp
SUEDE

Date of mailing (day/month/year) 21 November 1995 (21.11.95)		
Applicant's or agent's file reference Case 484 PCT		IMPORTANT NOTIFICATION
International application No. PCT/SE95/01206	International filing date (day/month/year) 17 October 1995 (17.10.95)	Priority date (day/month/year) 24 October 1994 (24.10.94)
Applicant PERSTORP FLOORING AB et al		

The applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to the following application(s):

<u>Priority application No.:</u>	<u>Priority date:</u>	<u>Priority country:</u>	<u>Date of receipt of priority document:</u>
9403620-9	24 Oct 1994 (24.10.94)	SE	21 Nov 1995 (21.11.95)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

B. Fitzgerald

Telephone No.: (41-22) 730.91.11

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum)

Case 484 PCT

Box No. I TITLE OF INVENTION Process for the production of a floor strip	
Box No. II APPLICANT	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> Perstorp Flooring AB Strandridaregatan 8 S-231 25 Trelleborg Sweden	<input type="checkbox"/> This person is also inventor. Telephone No. +46 410 50100 Facsimile No. +46 410 15560 Teleprinter No.
State (i.e. country) of nationality: Sweden	State (i.e. country) of residence: Sweden
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> Kornfält, Sven Sallerupsvägen 18 S-212 18 Malmö Sweden	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: Sweden	State (i.e. country) of residence: Sweden
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> Stenberg, Yngve c/o Perstorp AB S-284 80 Perstorp Sweden	Telephone No. +46 435 38310 Facsimile No. +46 435 38920 Teleprinter No. 72000 perstp s
<input type="checkbox"/> Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS	
<i>If none of the following sub-boxes is used, this sheet is not to be included in the request.</i>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> Bengtsson, Per Skolgatan 13 B S-260 51 Ekeby Sweden	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: Sweden	State (i.e. country) of residence: Sweden
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> Sjölin, Hans Klockarevägen 5 S-284 33 Perstorp Sweden	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: Sweden	State (i.e. country) of residence: Sweden
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> (Empty)	This person is: <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality:	State (i.e. country) of residence:
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> (Empty)	This person is: <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality:	State (i.e. country) of residence:
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** KE Kenya, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, DE Germany, DK Denmark, ES Spain, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|---|
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> SD Sudan |
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| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TM Turkmenistan |
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| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> UZ Uzbekistan |
| | <input checked="" type="checkbox"/> VN Viet Nam |
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The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIMFurther priority claims are indicated in the Supplemental Box ☐

The priority of the following earlier application(s) is hereby claimed:

Country (in which, or for which, the application was filed)	Filing Date (day/month/year)	Application No.	Office of filing (only for regional or international application)
item (1) Sweden	24-10-1994 24 October 1994	9403620-9	
item (2)			
item (3)			

Mark the following check-box if the certified copy of the earlier application is to be issued by the Office which for the purposes of the present international application is the receiving Office (a fee may be required):

☐ The receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):
Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA /

Earlier search Fill in where a search (international, international-type or other) by the International Searching Authority has already been carried out or requested and the Authority is now requested to base the international search, to the extent possible, on the results of that earlier search. Identify such search or request either by reference to the relevant application (or the translation thereof) or by reference to the search request.

Country (or regional Office):

Date (day/month/year):

Number:

Sweden

24 October 1994

SE 94/00887

Box No. VIII CHECK LIST

This international application contains the following number of sheets:

1. request : 4 sheets
 2. description : 5 sheets
 3. claims : 1 sheets
 4. abstract : 1 sheets
 5. drawings : 4 sheets

Total : 15 sheets

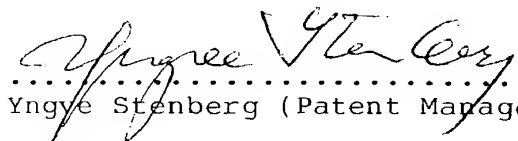
This international application is accompanied by the item(s) marked below:

1. ☐ separate signed power of attorney
 2. ☒ copy of general power of attorney
 3. ☐ statement explaining lack of signature
 4. ☐ priority document(s) identified in Box No. VI as item(s)
 5. ☒ fee calculation sheet
 6. ☐ separate indications concerning deposited microorganisms
 7. ☐ nucleotide and/or amino acid sequence listing (diskette)
 8. ☒ other (specify): ITS-report
 Official letter

Figure No. of the drawings (if any) should accompany the abstract when it is published.

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



 Yngve Stenberg (Patent Manager)

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GB 1088566

OCT 1967

SPECIFICATION

DRAWINGS ATTACHED

Inventor: HERBERT HAAS

Date of Application and filing Complete Specification: March 1, 1965.

No. 8655/65.

Complete Specification Published: Oct. 25, 1967.

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Index at acceptance:—B5 N(17Y, 20Y, 41X, 55Y, 56X, 68X, 69X, 70X, 707, 78Y, 79Y, 178, 184, 189, 192, 214, 225, 226, 239, 250, 253X, 300X, 301X, 303X, 304X, 410, 546, 556, 620, 663, 666, 669, 670, 671, 679, 682, 683, 736, 758, 759)

Int. Cl.—B 32 b 27/04, B 32 b 27/42

COMPLETE SPECIFICATION

Improvements in making Laminates

We, FORMWOOD LIMITED, of Tufthorn Avenue, Coleford, Gloucestershire, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method of manufacturing laminates of thermosetting resin sheets and wood fibre plates, wood shaving mouldings, or the like, by accelerating the flow and curing process of the thermosetting resins for reducing the curing times thereof.

It is already known that aminoplast moulding compositions can be cured by admixing a curing catalyst in a dry and in some circumstances crystalline form with the moulding composition in measured quantities so that the flowing properties and rate of curing of the composition can be adjusted within determined limits, taking its moisture content into account. This method cannot be applied to resinated sheets or the like because the resinous and catalyst components would have to be applied wet (as a solution or dispersion), which would give them only a restricted stability in storage, since the moulding composition would cure spontaneously owing to the added curing catalyst.

The main deficiency in the coating of wood shaving mouldings, wood fibre plates, or the like has hitherto been the high degree of shrinkage of the mouldings due to long periods of remaining in the heated moulding tool necessary for the hardening process. As a result of this shrinkage of the mouldings the pressure inside the mould drops in part if not entirely, which is particularly so in the case of shaped parts.

For example, bodies moulded from wood shavings may shrink so intensively that they partially lose all contact with the mould, so

as to be no longer under active pressure on all sides. Owing to this circumstance, it may occur, for example, that the decorative coating layer or the outer sheet layer pressed over the moulding is free and without contact pressure in many places during the flowing and hardening period of the moulding. The result is that the enclosed macromolecular gas bubbles which are produced and lie in the upper layer to be hardened are enabled to expand as the mould pressure decreases. But to some extent they are also able to rise to the surface, if they have not already reached it in expanding. If these minute gas bubbles, which can normally be detected only with the aid of especially fine optical means, lacking the requisite counter-pressure, reach the surface in their multitude, they cause a fine open outer skin to be formed over the surface of the coated moulding. Coated parts which exhibit such superficial damage in their outer skin, that is to say in the extremely fine surface zone, are unusable and must therefore be rejected as waste. The numbers of such waste rejects may be very high, depending in each case on the shape and form of the surface-coated body. The cracked surface parts are rough, lack all lustre, pick up dirt, and are particularly susceptible to abrasion. Since, especially in the case of the manufacture of mouldings produced from wood shavings, large and expensive parts are concerned, no firm can afford these high wastage figures; nor can they put on the market any poor specimens of finished products, which might prejudice in an economic sense the whole method as applied hitherto to large and costly parts.

It is an object of the present invention to provide a method whereby these deficiencies are overcome, so as to enable all the aforesaid disadvantages to be obviated by satisfactory and simple means, while at the same time

[Price 4s. 6d.]

achieving a substantial increase in production as a consequence of the considerably shorter curing times.

In the manufacture without wastage or with very little wastage of laminates of thermosetting resin sheets and wood fibre plates, wood shaving mouldings, or the like, the method in accordance with the present invention aims at reducing the time during which the parts are exposed to heat under pressure, thereby entirely or at any rate partially preventing shrinkage of the parts in the mould or in the pressing tool.

However, the pressing and curing or flowing time can only be reduced if the curing substances, for example acids, such as ammonium chloride when formaldehyde resins are used, which act as catalyst accelerating the flow and curing process, are added to the binding agent. It is not possible to add the curing substances immediately to the thermosetting resin binding agent, as this reduces the stability in storage of the foils, causing premature curing of the binder, whereby its effectiveness is impaired or it is rendered useless.

Accordingly, the present invention consists in a method of manufacturing laminates of thermosetting resin sheets and wood fibre plates, wood shaving mouldings or the like, by accelerating the flow and curing process of the thermosetting resins for reducing the curing times thereof, wherein a sheet impregnated with a curing catalyst and thereafter dried is placed under thermosetting resin-impregnated or treated sheets of paper, textile material, fleece, metal foil, or the like to be bonded, irrespective of whether said sheets form balance layers, barrier layers or decorative layers, whereby the thermosetting resin during the pressing operation and an application of heat is under the effect of accelerated flow and curing process.

The sheets carrying the catalyst may be provided as early as during their production with the ingredients which catalytically accelerate the curing and flow properties. This method saves subsequent saturation or impregnation and drying of the carrier papers.

The catalyst-carrying sheets may also consist of a glass silk or glass fibre fleece or of textiles. These have the advantage that the lined outer zones can be given quite special properties, particularly in respect of wear and surface impact strength.

Furthermore, in the case of statically stressed structural parts, the pressure and tension zone can thereby be strengthened, thus allowing dimensions to be made considerably smaller, thereby in turn affording the possibility of desirably light-weight forms of construction and economies of material.

In order that the invention may be more readily understood, reference is made to the accompanying drawing which illustrates diagrammatically and by way of example a sec-

tion through a moulding produced from wood shavings with the different laminating sheets.

Referring to the drawing, reference numeral 1 indicates the moulded part made of wood shavings, on which is laid, on one side, a decorative sheet 2, a catalyst sheet 3, a barrier sheet 4 and again a catalyst sheet 5. On the other side, representing the rear side of the moulding, there are provided, for example, a melamine sheet 6, a catalyst sheet 7, a balance sheet 8 and again a catalyst sheet 9. The decorative sheet 2 may be impregnated paper, textile, glass fibre or any other sheet of material suitable for impregnation with thermosetting resins, such as melamine, urea or phenol. The catalyst sheet 3 may be alpha cellulose paper or the same as for the decorative sheet 2 but impregnated with a catalyst, such as ammonium chloride. The barrier sheet 4 may be the same as the decorative sheet 2. All the sheets or layers are pressed together with the moulding 1 under the effect of heat in a known pressing mould (not shown).

In some cases it will be sufficient to use only one catalyst sheet or layer in each case, namely those indicated by 3 and 7. In this case the two plastics-impregnated foils, for example 2 and 4 or 6 and 8 each enclose one hardener sheet.

WHAT WE CLAIM IS:—

1. A method of manufacturing laminates of thermosetting resin sheets and wood fibre plates, wood shaving mouldings or the like, by accelerating the flow and curing process of the thermosetting resins for reducing the curing times thereof, wherein a sheet impregnated with a curing catalyst and thereafter dried is placed under thermosetting resin-impregnated or treated sheets of paper, textile material, fleece, metal foil, or the like to be bonded, irrespective of whether said sheets form balance layers, barrier layers or decorative layers, whereby the thermosetting resin during the pressing operation and an application of heat is under the effect of accelerated flow and curing process.

2. A method as claimed in Claim 1, wherein the sheet impregnated with a curing catalyst and subsequently dried may consist of an alpha cellulose paper or other carrier substances, while it is not indispensably necessary that such sheets must be subsequently saturated or impregnated with the catalyst, but as early as during their production the catalyst may be added to them.

3. A method as claimed in Claim 1, wherein the carrier substance for the sheet carrying the curing catalyst is a textile fabric or a glass fibre or glass silk fleece.

4. A method as claimed in Claim 1, wherein between a decorative sheet or layer and a barrier layer or between a melamine and a balance layer, respectively, a catalyst sheet is laid.

5. A method of manufacturing laminates,

substantially as herein described with reference
to the accompanying drawing.

6. A laminate whenever produced by the
method as claimed in any one of the preceding
5 Claims.

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Agents for the Applicants.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

